AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A communication method for a noncontact RF ID system comprising:

communicating a data sequence having a first waveform which corresponds to one of codes "0" or "1" and which has a length of time T;

communicating a data sequence having a second waveform which corresponds to the other of said codes "0" or "1" and which has a length of time T; and

communicating a data sequence having a third waveform which corresponds to m (m is a natural number equal to or greater than 2) codes, where each of said m codes is the other of said codes "0" or "1" expressed by the second waveform, and where the third waveform has a length of time mT, wherein

the first waveform with 50% duty ratio is in a low level state at a starting point, is in a high level state at an end point and rises only at a position of T/2,

the second waveform with 50% duty ratio is in a high level state at a starting point, is in a low level state at an end point and rises only at a position of T/2, and

the third waveform with 50% duty ratio is in a ~~low~~ high level state at a starting point, is in a ~~high~~ low level state at an end point and rises only at a total of m positions of T/2 + nT (n=0. . . ., m-1).

2. (Previously Presented) A communication method for a noncontact RF ID system comprising:

communicating a data sequence having a first waveform which corresponds to one of codes "0" or "1" and which has a length of time T;

communicating a data sequence having a second waveform which corresponds to one of codes "0" or "1" opposite to the first waveform and which has a length of time T; and

communicating a data sequence having a third waveform which corresponds to m (m is a natural number equal to or greater than 2) codes that are same code as the second waveform and which has a length of time mT, wherein

the first waveform with 50% duty ratio is in a high level state at a starting point, is in a low level state at an end point and falls only at a position of T/2,

the second waveform with 50% duty ratio is in a low level state at a starting point, is in a high level state at an end point and falls only at a position of T/2, and

the third waveform with 50% duty ratio is in a low level state at a starting point, is in a high level state at an end point and rises only at a total of m positions of T/2 + nT (n=0,..., m-1).

3. (Cancelled)

4. (Previously Presented) A communication method for a noncontact RF ID system according to claim 1, wherein:

in the case in which the state transition is rising, the first waveform is a waveform that maintains a low level in a negative time direction for T/2 from the point in time that the waveform first rises, which is a center point of the waveform, and maintains a high level state for T/2 in a positive time direction from this center point;

the second waveform is a waveform that maintains a high level state in the positive time direction for t1 from a point in time that the waveform first rises, which is the center point of the waveform, maintains a low level state for time t2 until an end point of the waveform, maintains a low level state in the negative time direction for time t1 from the center point of the waveform, and maintains a high level state for time t2 until a starting point of the waveform (here, t denotes time, T denotes one cycle of the first and second waveforms, and t1 + t2 = T/2); and

the third waveform is a C(2n) waveform which, in the case in which m=2n, maintains a high level state in the positive time direction for t6 from the point in time that the waveform first rises; maintains a low level state in the negative time direction for t3 from the point in time that the waveform first rises; maintains a high level state for time t4 until the starting point of the waveform; maintains a high level state in the positive time direction for t{2 (n - k) + 6} from the point in time that the waveform rises for the (n + 1 - k)th time;

maintains a low level state for t {2 (n - k) + 3} in the negative time direction from the point in time that the waveform rises for the (n + 1 - k)th time; maintains a high level state in the positive time direction for T/2 from the point in time that the waveform rises for the nth time; maintains a low level state in the negative time direction for t{2 (n - 1) + 3} from the point in time that the waveform rises for the nth time; maintains a high level state in the positive time direction for t{2 (n - 1) +3} from the point in time that the waveform rises for the (n + 1)th time; maintains a low level state in the negative time direction for T/2 from the point in time that the waveform rises for the (n + 1)th time; maintains a high level state in the positive time direction for t{2 (n - k) + 3} from the point in time that the waveform rises for the (n + k)th time; maintains a low level state in the negative time direction for t {2 (n - k) + 6} from the point in time that the waveform rises for the (n + k)th time; maintains a low level state in the negative time direction for t6 from the point in time that the waveform rises the last time; maintains a high level state in the positive time direction for t3 from the point in time that the waveform rises the last time; and maintains a low level state for time t4 until an end point of the waveform, where n and k are natural numbers; n ≥ k ≥ 1; t is time; T is one cycle of the first and second waveforms; and t3 + t4 = T/2; t{2 (n - k) + 5} + t{2 (n - k) + 6} = T (when n and k ≥ 2); and

in the case in which m = 2n + 1, the third waveform is a C(2n + 1) waveform that maintains a high level state in the positive time direction for t6 from the point in time that the waveform first rises; maintains a low level state in the negative time direction for t3 from the point in time that the waveform first rises; maintains a high level state for t4 from the starting point of the waveform; maintains a high level state in the positive time direction for t{2 (n - k) + 6} from the point in time that the waveform rises for the (n + 1 - k)th time; maintains a low level state in the negative time direction for t{2 (n - k) + 3} from the point in time that the waveform rises for the (n + 1 - k)th time; maintains a high level state in the positive time direction for t{2 (n - 1) + 5} from the point in time that the waveform rises for the (n + 1)th time; maintains a low level state in the negative time direction for t{2 (n - 1) + 5} from the point in time that the waveform rises for the (n + 1)th time; maintains a high level state in the positive time direction for t{2 (n - k) + 3} from the point in time that the

waveform rises for the (n + 1 + k)th time; maintains a low level state in the negative time direction for t{2 (n - k) + 6} from the point in time that the waveform rises for the (n + 1 + k)th time; maintains a low level state in the negative time direction for t6 from the point in time that the waveform rises the last time; maintains a high level state in the positive time direction for time t3 from the point in time that the waveform rises the last time; and maintains a low level state for t4 until the end point of the waveform; (where n and k are natural numbers, $n \geq k \geq 1$, t is time, T is one cycle of the first and second waveforms, $t3 + t4 = T/2$, and $t\{2 (n - k) + 5\} + t \{2 (n - k) + 6\} = T$).

5. (Previously Presented) A communication method for a noncontact RF ID system according to 2, wherein:

in the case in which the state transition is a falling state transition, the first waveform is an inverted waveform that maintains a low level in a negative time direction for T/2 from the point in time that the waveform first rises, which is a center point of the waveform, and maintains a high level state for T/2 in the positive time direction from this center point;

the second waveform is an inverted waveform that maintains a high level state in the positive time direction for t1 from the point in time that the waveform first rises, which is the center point of the waveform, maintains a low level state for time t2 until the end point of the waveform, maintains a low level state in the negative time direction for time t1 from the center point of the waveform, and maintains a high level state for time t2 until the starting point of the waveform (here, t denotes time, T denotes one cycle of the first and second waveforms, and $t1 + t2 = T/2$); and

the third waveform is an inverted C(2n) waveform which, in the case in which m=2n, maintains a high level state in a positive time direction for t6 from the point in time that the waveform first rises; maintains a low level state in the negative time direction for t3 from the point in time that the waveform first rises; maintains a high level state for time t4 until the starting point of the waveform; maintains a high level state in the positive time direction for t{2 (n - k) + 6} from the point in time that the waveform rises for the (n + 1 - k)th time; maintains a low level state for t {2 (n - k) + 3} in the negative time direction from the point in

time that the waveform rises for the (n + 1 - k)th time; maintains a high level state in the positive time direction for T/2 from the point in time that the waveform rises for the nth time; maintains a low level state in the negative time direction for t{2 (n - 1) + 3} from the point in time that the waveform rises for the nth time; maintains a high level state in the positive time direction for t{2 (n - 1) +3} from the point in time that the waveform rises for the (n + 1)th time; maintains a low level state in the negative time direction for T/2 from the point in time that the waveform rises for the (n + 1)th time; maintains a high level state in the positive time direction for t{2 (n - k) + 3} from the point in time that the waveform rises for the (n + k)th time; maintains a low level state in the negative time direction for t {2 (n - k) + 6} from the point in time that the waveform rises for the (n + k)th time; maintains a low level state in the negative time direction for t6 from the point in time that the waveform rises the last time; maintains a high level state in the positive time direction for t3 from the point in time that the waveform rises the last time; and maintains a low level state for time t4 until the end point of the waveform, where n and k are natural numbers; n ≥ k ≥ 1; t is time; T is one cycle of the first and second waveforms; and t3 + t4 = T/2; t{2 (n - k) + 5} + t{2 (n - k) + 6} = T (when n and k ≥ 2); and

in the case in which m = 2n + 1, the third waveform is an inverted C(2n + 1) waveform that maintains a high level state in the positive time direction for t6 from the point in time that the waveform first rises; maintains a low level state in the negative time direction for t3 from the point in time that the waveform first rises; maintains a high level state for t4 from the starting point of the waveform; maintains a high level state in the positive time direction for t{2 (n - k) + 6} from the point in time that the waveform rises for the (n + 1 - k)th time; maintains a low level state in the negative time direction for t{2 (n - k) + 3} from the point in time that the waveform rises for the (n + 1 - k)th time; maintains a high level state in the positive time direction for t{2 (n - 1) + 5} from the point in time that the waveform rises for the (n + 1)th time; maintains a low level state in the negative time direction for t{2 (n - 1) + 5} from the point in time that the waveform rises for the (n + 1)th time; maintains a high level state in the positive time direction for t{2 (n - k) + 3} from the point in time that the waveform rises for the (n + 1 + k)th time; maintains a low level state in

the negative time direction for t{2 (n - k) + 6} from the point in time that the waveform rises for the (n + 1 + k)th time; maintains a low level state in the negative time direction for t6 from the point in time that the waveform rises the last time; maintains a high level state in the positive time direction for time t3 from the point in time that the waveform rises the last time; and maintains a low level state for t4 until the end point of the waveform; (where n and k are natural numbers, $n \geq k \geq 1$, t is time, T is one cycle of the first and second waveforms, $t3 + t4 = T/2$, and $t\{2 (n - k) + 5\} + t \{2 (n - k) + 6\} = T$).

6. (Cancelled)

7. (Previously Presented) A noncontact RF ID system which uses the communication method according to any one of claims 1 to 5, comprising:

a reader for transmitting data information that include data and a clock; and

a transponder which receives the data information from the reader comprising an antenna for receiving the signal from a reader, a DC power detecting circuit; a signal detecting circuit, an input amplifier, a clock generating device, a demodulator, a control logic circuit, and a memory, wherein

the DC power detecting circuit comprising a power accumulating capacitor that activates the transponder when a signal is received;

the clock generating device that generates an internal clock such that the state transition of the internal clock is generated in synchronism with the timing of the rise of the modulating signal; and

the control logic circuit that operates in synchronism with the state transition of the clock generated by the clock generating device.

8. (Previously Presented) A transmitter in the noncontact RF ID system according to claim 7, that forms and transmits data information comprising a first waveform, a second waveform, and a third waveform, wherein:

the first waveform and the second waveform are formed by a basic waveform that has a state transition that either rises or falls at the approximate center part of the waveform;

the third waveform is formed by a plurality of basic waveforms that have one state transition at the approximate center part of the waveform and said one state transition is generated only at the approximate center part of the plurality of basic waveforms; and

transmission is carried out by using the third waveform in place of the first waveform and the second waveform in the case in which transmission is carried out using the first waveform and the second waveform and in the case in which said one state transition is generated outside the approximate center part of the waveform.

9. (Previously Presented) A receiver in the noncontact RF ID system according to claim 7, that receives data information comprising a first waveform and a second waveform, and a third waveform,

wherein, the first waveform and the second waveform are formed by a basic waveform that has a state transition that either rises or falls at the approximate center part of the waveform;

the third waveform is formed by a plurality of basic waveforms that have one state transition at the approximate center part of the waveform and the one state transition is generated only at the approximate center part of the plurality of basic waveforms; and

in the case in which the third waveform is received, the receiver recognizes the reception of a combination of the first waveform and the second waveform in which said one state transition has occurred outside the approximate center of the basic waveform.

10. (Previously Presented) A method of transmitting and receiving modulated data information comprising a first waveform, a second waveform, and a third waveform, in the noncontact RF ID system according to claim 7, comprising the steps of:

transmitting modulated signals including data information and clock information from a reader to a transponder;

detecting the modulated signals by the signal detecting circuit of a transponder;

dividing the signal into the data information and the clock by the clock generating circuit and the demodulator;

analyzing the data information comprising a first waveform, a second waveform and a third waveform by the control logic circuit; and

responding to the reader a data after forming the data information in the transponder, when necessary.